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# Design Report

#### Database Architecture

#### Database Schema:

#### Our database is designed using a relational model with three main tables:

#### Users: Stores user information such as user ID, username, and other relevant details.

#### Channels: Manages information about communication channels, including channel ID and related data.

#### Messages and Replies: Two tables capturing the content and interactions within channels.

#### Relationships:

#### Each message or reply is associated with a specific user through foreign key constraints.

#### Channels are linked to messages and replies based on the channel ID.

#### Key Decisions:

#### Use of SQL for relational data storage.

#### Utilization of foreign key relationships for data integrity.

#### React Application Architecture

#### Components:

#### Chat Area Component: Responsible for rendering messages, replies, and handling user interactions.

#### Search Component: Facilitates searching for content, users, and provides insights into user statistics.

#### State Management:

#### Leveraging Reacts local state for managing user inputs and component-specific data.

#### Utilizing React Context API for global state management.

#### Key Decisions:

#### Adopted a component-based architecture for modular development and maintenance.

#### Applied React Hooks for efficient state management and lifecycle methods.

#### Future Considerations:

#### Authentication: Implement user authentication for secure access.

#### Optimizations: Explore performance optimizations, especially for real-time interactions.

#### User Interface Enhancements: Continuously improve the user interface for better user experience.